

# 1990 PRODUCT CATALOG

**COMMUNICATIONS SPECIALISTS, INC.**  
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CHOICE SELECTIONS  
 NEW FOR 1990!  
 •POCSAG ENCODER  
 •TWO-TONE ENCODER  
 •HANDHELD PROGRAMMER  
 (SEE PAGES 6-7)



# THE IC-110 STORY

With the introduction of the IC-110 custom CMOS microcircuit a couple of years ago, the versatility of several of our programmable tone products has greatly increased. The IC-110 is the successor of our older IC-107, which ushered in the age of programmability in tone signaling. Since that time, most tone signaling manufacturers have followed suit and offered similar products. The big advantages of programmability are: a) the ability to change tone frequency without having to purchase a different tone element or reed, b) the ability to set the frequency without a frequency counter or other measuring equipment, and c) the high degree of accuracy over tunable and other methods of tone signaling. The only drawback was the inability to easily reach non-standard tones (other than the 32 EIA standard tones). With the IC-110, this has been resolved.

The IC-110 has all the advantages and capabilities of the tried and true IC-107, plus one new feature: The 32 tone frequencies stored in the memory are changeable. This means that if you have a requirement for tone frequencies

above, below, or in between the standard 32 EIA tones, the IC-110 memory can be customized to suit your requirement.

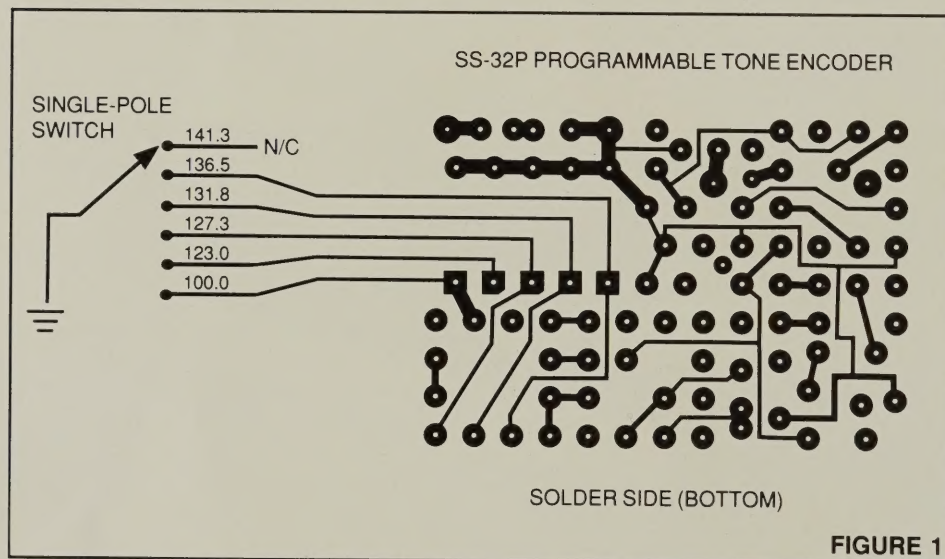
The new IC-110 has been designed into several of our products in the past couple of years. This includes the TS-32 series of CTCSS encoder-decoders, the SS-32 series of CTCSS and audible encoders, and the PE-2P and SD-1000 two-tone sequential encoder and decoder. The added capability that the IC-110 brings to these products is tremendous. Below is an example of how one CTCSS tone board can be used to switch between up to six different tone frequencies, just by changing one ground line WITH NO DIODE NETWORKS NECESSARY!

In the realm of two-tone sequential signaling, one SD-1000 decoder can now be set to decode any call within a typical 1000 call paging system. And with a little additional circuitry, the PE-2P encoder makes a great little mobile paging encoder. You may think of many other special applications that these new capabilities will allow now that secondary tone signaling is

allowed in all Part 90 services.

Normally, custom programming of the 32 memory locations is done at our factory when you order, then you may select any of the tones in the memory through binary coded switching lines (usually with an on-board DIP switch). If you change your mind about the 32 tones you want programmed into the memory, just send the tone board back to the factory and we will reprogram the IC-110 for free. If you wish to have the independent flexibility of changing the tones in memory yourself, you may purchase our HHP-1 programmer (the IC-110 does not use a standard programming algorithm so standard PROM programmers will not work).

Following is a method of changing CTCSS tones on our SS-32 series of encoders. Many commercial radio shops have found this to be an easy and inexpensive way to allow their customers to access multiple repeater sites on different tone frequencies. The only thing required is one tone board, and a ground line for each tone (up to six) that you want to switch between.



In the above diagram, the radio shop has provided their customer with the capability of accessing six repeater sites, just by changing grounds to the switching circuit of the SS-32PA. This may be done with the channel select switch, or a separate single pole, multiple position switch. In order to facilitate the single ground switching arrangement, without cumbersome diode networks, the IC-110 memory was rearranged, as shown in the adjusted tone location table, figure 2. The sixth tone is selected by not grounding any of the switching lines (location 32, no ground). This switching method may be used on any of our tone products that use the IC-110 microcircuit.

ADJUSTED TONE LOCATION TABLE		
LOCATION	SWITCH SETTING	FREQUENCY
	SWITCH NUMBER	
1	00000	67.0
2	10000	71.9
3	01000	74.4
4	11000	77.0
5	00100	79.7
6	10100	82.5
7	01100	85.4
8	11100	88.5
9	00010	91.5
10	10010	94.8
11	01010	97.4
12	11010	100.0
13	00110	103.5
14	10110	107.2
15	01110	110.9
16	11110	100.0
17	00001	118.8
18	10001	123.0
19	01001	127.3
20	11001	131.8
21	00101	136.5
22	10101	141.3
23	01101	146.2
24	11101	123.0
25	00011	156.7
26	10011	162.2
27	01011	167.9
28	11011	127.3
29	00111	179.9
30	10111	131.8
31	01111	136.5
32	11111	141.3

0 = on = closed = ground  
1 = off = open

FIGURE 2

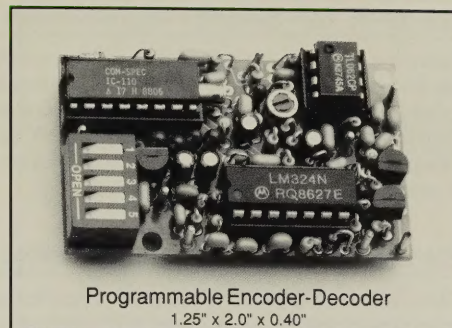


Also Known as PL™, Call Guard™, Channel Guard™, Etc.

# ENCODER-DECODERS, CTCSS (Sub-Audible)

## TS-32P DIP Switch Programmable Encoder-Decoder \$ 57.95

Universal design provides CTCSS capability to all FM transceivers. On-board DIP switch allows instant programming without tone elements, counters, or other test equipment. Crystal controlled for high accuracy and stability. The 32 location tone memory is complete with standard EIA tones from 67.0 to 203.5 Hz, or may be ordered with ANY 32 custom tone frequencies between 0 - 250.0 Hz ( $\pm 0.1$ Hz) at no extra charge. Multiple tone switching is easily done with your radio's channel select switch or separate single pole switch. A high pass tone rejection filter is included on board to remove tone from received audio. Reverse polarity protection and RF immunity are built in. Powered by 6 - 24 vdc, unregulated at 8ma. Supplied with color-coded wires that are terminated to plug directly onto the TS-32P. Mounting materials include hardware and double-sided, insulated tape.



## TSU-32P Plug-on type Encoder-Decoder (for special applications) \$ 57.95

This unit has the same circuit as the TS-32P above, but the chassis pins extend from the bottom of the board. This facilitates direct plug-on to special application boards that are designed to be plugged right into many popular radios (see plug-in boards below).

TS-32P is available as a direct plug-in to the following radios:

Aerotron				Repco			
Aerocom Six, Eight, Mpac, etc.	TS-32A	\$ 65.50		RSM	TS-32JRC	\$ 60.95	
Repeater Panel	TS-32F	67.90		Ritron			
60PM2 Handheld	TSA-32	63.33		Jobcom (150 Mhz)	RTS-2P	60.95	
Ferritronics				Sonar			
Repeater Panel	TS-32F	67.90		FM-2112 / 2114	TS-32JRC	60.95	
Genave				Standard			
Mobiline I, II, III, GMT-110, 115U, etc.	TS-32G	65.50		734L and other handhelds (1 plug)	TS-32HBH	64.95	
General Electric				plus adapter	01-1030	7.50	
Shared Repeater Panel 19D402486-G1	AP-1	39.95		867 and other mobiles (2 plugs)	TSS-32	62.50	
Holds up to four...	TSU-32P	57.95		TAD			
MVP	TS-32P	57.95		M1520-454 handheld	TS-32HBL	64.95	
plus adapter	01-1012	2.00		plus adapter	01-1031	6.00	
Mastr II	TS-32MSTII	66.95		TAC TEC (RCA)			
Johnson (E.F.)				TAC-100 (RCA TACTEC)	TS-32TSI-NP	63.95	
Fleetcom I (504, 527, 528, 550, 557, etc.)	TS-32J	65.50		TAC-200 (RCA VEETAC)	TS-32TAC-1	76.26	
Fleetcom II	TS-32P	57.95		or for two-tone	TS-32TAC-2	80.92	
plus adapter	01-1013	1.60		310SX (on options board)	TS-32TSIEP	57.95	
PPL Series (6040, 6050, 6060, etc.)	TS-32JP	63.50		Telefunken			
SDL (w/o PROM)	TS-32SDL	73.79		FM15H	TSA-32	63.33	
Transcom II (see Fleetcom II)				Tempo			
Ultracom II (see Fleetcom II)				FMH 12/15 & 40/44	TSA-32	63.33	
JRC (Japan Radio Co.)				Wilson			
JHM-45S50	TS-32JRC	60.95		HH-154 & HH-454 handhelds	TSW-32	60.60	
Motorola				WU100R, WU151R, WU154SR	TS-32R	65.50	
Micor	TS-32MCR	66.95		Yaesu			
Mitretek	TS-32P	57.95		FT-207R	FTS-32ED	61.95	
plus adapter	01-1016	2.00		FT-208/209 & 708/709	TSY-32	59.95	
Pace				FT-290/690	TS-32P	57.95	
Landmaster II	TS-32P	57.95		plus adapter	01-1001	2.00	
plus adapter	01-1004	2.00		FT-726R	TS-32P	57.95	
Landmaster III	TS-32P	57.95		plus adapter	01-1018	2.00	
plus adapter	01-1014	2.00		FTC-1525/1540	FTS-32ED	61.95	
RCA (see TAC TEC)				FTC-2003	FTS-32ED	61.95	
Regency				FTC-2024/2025	FTS-32ED	61.95	
MCP-401 / 404 Handheld	TSW-32	60.60		FTC-4610/4625	TSY-32	59.95	
Repeaters U10, U11, BTH-201B	TS-32R	65.50		plus adapter	01-1019	3.00	
UC102	TSW-32R	60.60					

Also available are instructions for direct installation of the TS-32P in many popular radios. Give us the name of your radio when you order and we will supply you with a diagram, or we can indicate the hook-up points on your schematic.



# ENCODERS, CTCSS (sub-audible) & BURST TONE

## SS-32PA DIP Switch Programmable CTCSS Encoder \$ 28.95

Universal design provides CTCSS encode capability to all FM transceivers. On-board DIP switch allows instant programming without tone elements, counters, or other test equipment. Crystal controlled for high accuracy and stability. The standard 32 tone memory contains the EIA tones from 67.0 to 203.5 Hz, (or may be ordered with ANY 32 custom tone frequencies between 0 - 250.0 Hz at no extra charge). Multiple tone switching is easily achieved with your radio's channel select switch or a separate single pole switch.

## SS-32PB DIP Switch Programmable Burst-tone Encoder \$ 28.95

Provides an audible burst or continuous tone for accessing older burst tone decoders and for other special applications. An on-board DIP switch allows instant programming to any one of 32 common burst tone frequencies including tones between 1600 and 2550, in 50 Hz increments. If requested when ordering, ANY 32 tones within a range of 250.0 to 3000.0 Hz ( $\pm 0.1$ Hz) may be programmed into the memory at no extra charge. Multiple tone switching is easily achieved with your radio's channel select switch or a separate single pole rotary switch.

## SS-32SMP Micro-Miniature CTCSS Encoder \$ 27.95

Super small programmable CTCSS encoder for use in handheld radios and other size restricted applications. Has the same basic features as the SS-32PA (see above), but does not include the on-board DIP switch due to size limitations. Programming is done by soldering binary coded jumpers on the tone board.

## SS-32SMP-B Micro-Miniature Audible Tone Encoder \$ 32.95

Super small programmable encoder for audible tone generation within the tone range of 250.0 to 3000.0 Hz. May be used to perform special audible tone signaling functions from a handheld radio or other size restricted enclosure. Programming is done by soldering binary coded jumpers on the tone board, which take the working tone frequency from a previously specified 32 tone memory. Please specify your desired tone frequencies when ordering.

## TE-12PA Self-Contained 12 Tone CTCSS Encoder \$ 89.95

Fully enclosed CTCSS encoder provides twelve rotary switch selectable tones. Each of the twelve switch positions is individually programmable to any of the 32 standard EIA tones from 67.0 to 203.5 Hz. Packaged in a high impact plastic case, with mounting bracket and hardware supplied.

## TE-12PB Self-Contained 12 Tone Burst Encoder \$ 89.95

Fully enclosed Burst Tone encoder provides twelve rotary switch selectable tones. Each of the twelve switch positions is individually programmable to any one of 32 audible frequencies, including common burst tones from 1600 to 2550, in 50 Hz increments. Packaged in a high impact plastic case, with mounting bracket and hardware supplied.

## TE-64 Multi-purpose CTCSS/Burst Tone Encoder \$ 79.95

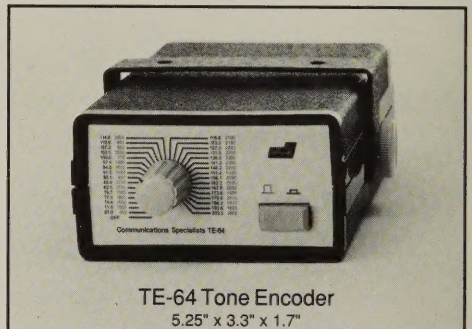
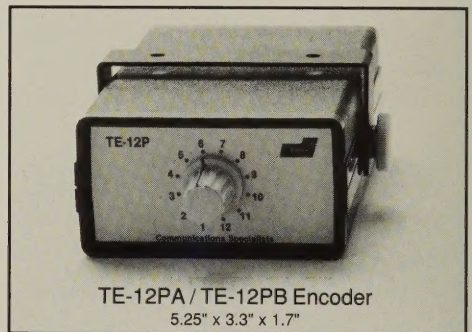
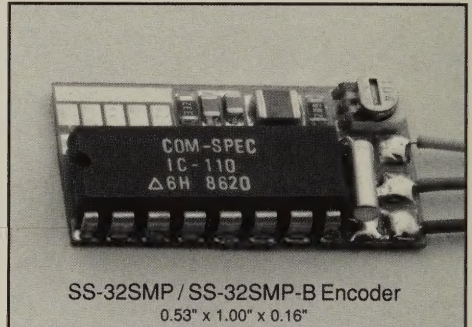
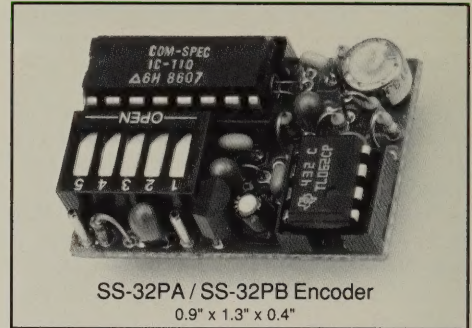
Fully enclosed encoder provides, from a front dial rotary switch, all EIA CTCSS tones from 67.0 to 203.5 Hz PLUS all the common burst tones from 1600 to 2550 in 50 Hz increments. All available tone frequencies are permanently screened onto the faceplate, and selected with a calibrated dial. Great for test bench or service vehicle applications. Operates on 6-30 vdc, and all connections are made to a terminal strip at the rear of the unit. A 9 volt battery plug and cable is included, and may be attached at the terminal strip or soldered directly to the circuit board for field operation. Packaged in a high impact plastic case, with mounting bracket and hardware supplied.

## TE-64D Multi-purpose CTCSS/Burst Tone Encoder w/ Display \$ 129.90

An enhanced version of the TE-64 encoder (see above). Features a two-digit LED which displays a number from 01 to 32 that in turn corresponds with the CTCSS or burst frequency selected by the front panel rotary switch. The two-digit number displayed is cross-referenced to the tone frequency on a chart located on the faceplate. Perfect for mobile applications, night-time operations, or whenever high visibility read-out is desired. Operates on 6-16 vdc (current draw does not allow operation from 9 volt battery).

## TE-64D-MOD Kit \$ 49.95

Adapter kit for upgrading TE-64 to TE-64D. Available as a kit, or you may return your TE-64 for free factory installation.



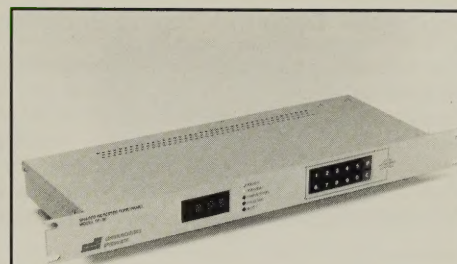


# REPEATER PRODUCTS

## TP-38 Shared Repeater Tone Panel

**\$ 595.00**

Microprocessor controlled repeater tone panel. The TP-38 provides all 38 EIA standard CTCSS tones to allow up to 38 subscribers without the need to purchase additional cards or programming. All features are user programmable and included with each unit. Built-in time and hit counters record the activity of all CTCSS tones, whether activated or not. The TP-38 is static and lightning protected, and draws very little current, making it practical for solar and battery powered repeater sites. A non-volatile memory retains programming in the event of a power loss. All necessary functions can be performed at the repeater site, without requiring any additional equipment. Remote access is possible with the addition of a low cost DTMF decoder module (see TP-DTMF below).

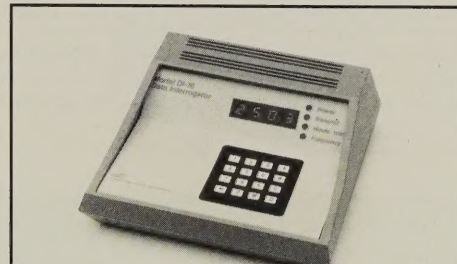


TP-38 Shared Repeater Tone Panel  
19.0" x 1.7" x 6.0"

## TP-DTMF Remote Access Decoder Module

**\$ 59.95**

Add-on option to the TP-38 to allow offsite control. With the TP-DTMF installed, all TP-38 program parameters are remotely accessible with a DTMF keypad and a simplex transceiver, including the ability to activate or deactivate individual subscribers. Available on new TP-38's, or easily field installed into existing units.



DI-16 Data Interrogator  
7.5" x 7.8" x 2.7"

## TP-DCS Digital CTCSS Module

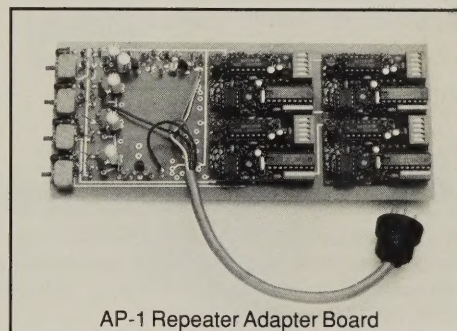
**\$ 149.95**

Add-on option to the TP-38 which allows the addition of 14 DCTCSS subscribers, as well as 37 CTCSS subscribers in one TP-38. Compatible with Motorola "Digital Private Line", General Electric "Digital Channel Guard", and E.F. Johnson "Digital Call Guard". All DCTCSS codes between 000 and 777 octal are available in normal or inverted polarity. Time and hit accumulation, remote access, remote data retrieval and squelch tail elimination are all provided. Available on new TP-38's, or may be factory retrofitted into existing units.

## TP-TOS Switch Output Module

**\$ 99.95**

Add-on option to the TP-38 which provides individual discrete switch outputs for the standard 32 EIA CTCSS tone frequencies (from 67.0 to 203.5Hz). The 32 outputs will provide either a pull to logic ground, logic high, or may be used to route an audio signal to another transmitter, receiver, tape recorder, etc. Available on new TP-38's, or may be factory retrofitted into existing units.



AP-1 Repeater Adapter Board

## TP-DCS/TOS Combination Module

**\$ 199.95**

Combines the features of both the TP-DCS and TP-TOS (see descriptions above).

## DI-16 Remote Data Interrogator for TP-38

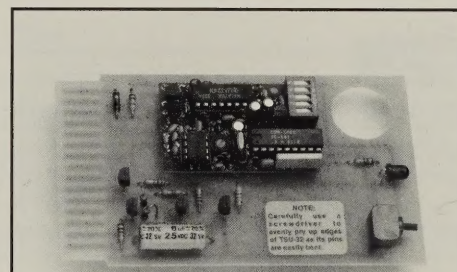
**\$ 249.95**

Allows remote access to the TP-38 for the purpose of retrieving time and hit information, as well as enabling or disabling repeater subscribers. All TP-38 functions may be performed remotely with the DI-16 (TP-DTMF is required in TP-38). The data is displayed on a four digit LED display, plus a serial output port is provided for output of the data to a computer or serial printer.

## AP-1 Repeater Adapter Board

**\$ 39.95**

Slide-in rack card designed for direct replacement in the General Electric Shared Repeater Panel (19D402486-G1), but will also adapt to any repeater. Each AP-1 card has mounting space for up to four TSU-32P encoder-decoders; plus up to two SS-32PA encoders may be added for separate encode tone applications. Individual switches for transmitter keying and LEDs to indicate decoding are built in. Also has provision for optional keying relay.

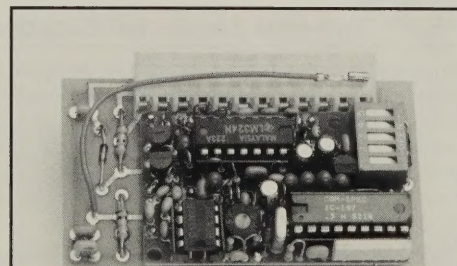


TS-32F Repeater Adapter Board, Ferritronics

## TS-32F Repeater Adapter Board, Ferritronics

**\$ 67.90**

Slide-in encoder-decoder card for the Ferritronics/Aerotron repeater rack. Provides one encode-decode tone using a single TSU-32P plug on encoder-decoder. An SS-32PA encoder may also be added for separate encode and decode tones. A momentary switch for transmitter keying and an LED to indicate decoding are built in.



TS-32R Repeater Adapter Board, Regency

## TS-32R Repeater Adapter Board, Regency

**\$ 65.50**

Plug-in encoder-decoder board for the Regency/Wilson U series repeaters. Uses a single TSU-32P plug on encoder-decoder adapted for direct plug in to the repeater.

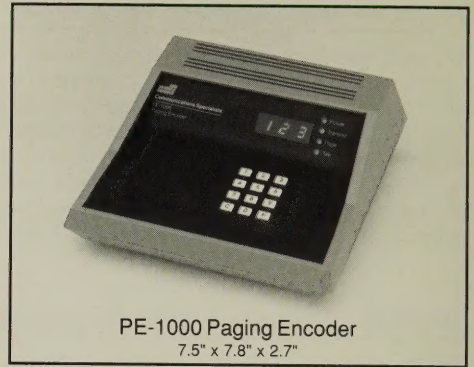


# PAGING ENCODERS

## PE-1000A Desk-top Paging Encoder, Two-Tone

**\$ 224.95**

Two-tone sequential desktop model paging encoder. The PE-1000A includes all the paging tones in Motorola groups 1 through 6, Motorola A, B, and Z, plus General Electric groups A, B, and C. The desired tone groups, as well as a substantial list of features are accessible by the field service technician from the front panel keyboard. This allows the PE-1000 to be customized to fit the specific application. All features are field programmable and included in every unit. A non-volatile memory retains the programming if a power loss occurs. For a 19" rack mounted version of the PE-1000A, use part no. PE-1000RM-A, priced at \$324.95.

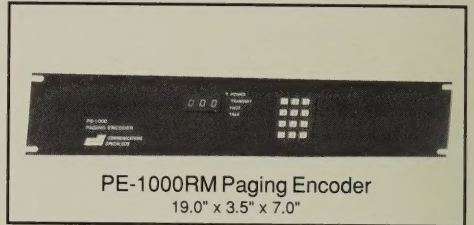


PE-1000 Paging Encoder  
7.5" x 7.8" x 2.7"

## PE-1000B Desk-top Paging Encoder, Five Tone

**\$ 249.95**

All the same features as the PE-1000A (above), but in Five-tone sequential format. Compatible with all 5-6 tone paging groups including EIA, ZVEII, CCIR/EEA, CCIT, EURO. For a 19" rack mounted version of the PE-1000B, use part no. PE-1000RM-B, priced at \$349.95.



PE-1000RM Paging Encoder  
19.0" x 3.5" x 7.0"

## PE-1000C Desk-top Paging Encoder, REACH™

**\$ 249.95**

All the same features as the PE-1000A (see above), but in REACH™ two-tone sequential format. Compatible with all REACH™ paging systems. As with all PE-1000 models, all options and features are field accessible from the front panel keyboard. For a 19" rack mounted version of the PE-1000C, use part no. PE-1000RM-C, priced at \$349.95.

## PE-1000D Desk-top Paging Encoder, Custom Tones

**\$ 249.95**

All the same features as the basic PE-1000A (see above), but with customer specified tone frequencies. When ordering, please specify the tone frequencies desired, and the group positions you would like them located in. For a 19" rack mounted version of the PE-1000D, use part no. PE-1000RM-D, priced at \$349.95.

**NEW!**

## PE-1000P Desk-top Paging Encoder, RPC1

**\$ 324.95**

All the same features as the PE-1000A (see above), but with RPC1 (formerly POCSAG) format. This is now the United Nations accepted standard and is widely used in Europe and throughout the world. The PE-1000P is capable of all numeric RPC1 codes. For a 19" rack mounted version of the PE-1000P, use part no. PE-1000RM-P, priced at \$424.95.

**NEW!**

## PE-2P Two-tone Sequential Encoder

**\$ 54.95**

Single call two-tone sequential encoder designed for installation inside the radio or other enclosure. Tone A and tone B are each DIP switch programmable from a memory base of 32 tones, specified when ordering. One unit is capable of any call in a 1000 call system. Excellent for use as a mobile paging encoder or, when teamed with our SD-1000 decoder, as the encoder for function calls. May be modified to send multiple calls. Comes complete with color coded push-on wires and full instructions. When ordering, please specify one of the following:

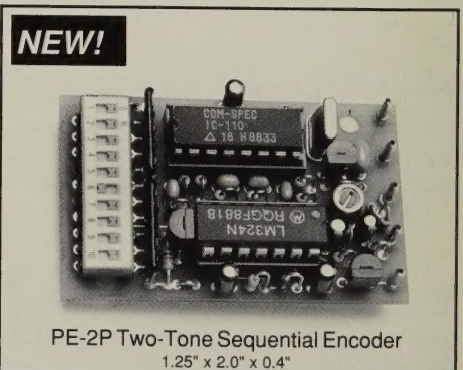
PE-2PA, all tones in Motorola groups 1,2,& 3.

PE-2PB, all tones in Motorola groups 4,5,& 6.

PE-2PC, all tones in Motorola groups A,B,& Z.

PE-2PD, all tones in GE groups A,B,& C.

PE-2PE, any 32 tones or combination of groups. (Please give tones when ordering)



PE-2P Two-Tone Sequential Encoder  
1.25" x 2.0" x 0.4"



# TWO-TONE SEQUENTIAL AND DTMF DECODERS

## SD-1000 Two-tone Sequential Decoder

**\$ 59.95**

Two-tone sequential decoder designed for installation inside the radio or other enclosure. Tone A and tone B are each DIP switch programmable from a memory base of 32 tones, specified when ordering. One unit is capable of any call in a 1000 call paging system as well as group calls. Three switched outputs are available simultaneously: #1 - Latched squelch output, high or low; #2 - Latched call light output; #3 - Momentary horn switch output. May also be ordered to encode a CTCSS tone while decoding two-tone sequential. Comes complete with color coded push-on wires and full instructions. When ordering, please specify one of the following:

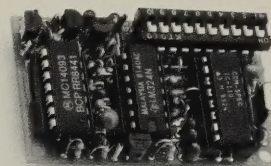
SD-1000A, all tones in Motorola groups 1,2,& 3.

SD-1000B, all tones in Motorola groups 4,5,& 6.

SD-1000C, all tones in Motorola groups A,B,& Z.

SD-1000D, all tones in GE groups A,B,& C.

SD-1000E, any 32 tones or combination of groups. (Please give tones when ordering)

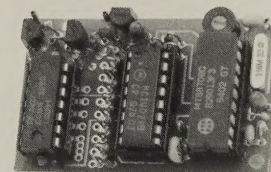


SD-1000 Two-Tone Sequential Decoder  
1.25" x 0.4" x 2.0"

## DTD-1 DTMF Decoder

**\$ 59.95**

Single call, single function DTMF decoder. Designed to provide small, high quality, low cost DTMF function decoding. May be programmed with wire jumpers to decode any of 5,040 four digit calls, providing a latched or momentary open collector output. Operates exceptionally well in bad signal-to-noise environments. Complete with color coded push-on installation wires and full instructions.



DTD-1 DTMF Decoder  
1.25" x 2.0" x 0.4"

# ACCESSORIES

**NEW!**

## HHP-1 Handheld Programmer For IC-110 Microcircuit

**\$ 199.95**

Portable programmer which allows the service shop technician to customize the tone frequencies in the 32 memory locations in our special IC-110 microcircuit. The IC-110 is used in several of our tone products, and contains a 32 tone memory which is accessed with binary coded DIP switches mounted on the tone board. The HHP-1 Programmer enhances the versatility of these tone products by allowing the technician to change the 32 memory tones. Any CTCSS tone from 0 to 250.0 Hz, or any audible tone from 250.0 to 3000.0 Hz may be programmed into the IC-110, depending on which reference crystal is used in the subject tone board. The tone memory in the IC-110 is changeable, so if you change your mind on the tone frequency, you can easily change the memory again. The HHP-1 is supplied with a nine volt battery for field use, but also has a jack for an external power source. An audio jack on the unit allows connection to an oscilloscope or frequency counter.

**NEW!**



HHP-1 Handheld Programmer for IC-110

## AR-12 Twelve Tone Adapter Board

**\$ 19.95**

Multi-tone adapter board for use with TS-32P encoder-decoder and SS-32P encoder. Provides mounting space for tone board and diode networks to allow multi-tone switching of up to twelve tones. Frequencies are selected with a single pole, multiple position switch (not supplied). Included in kit are all diodes, resistors and PCB needed for up to 12 tones. Complete unit measures 3.63" x 2.0" x 0.5".

## HP-1B High Pass Filter

**\$ 9.95**

Miniature in size, filters out frequencies below 300.0 Hz.

## PS-1 Base Power Supply

**\$ 5.00**

Provides 12vdc at 50ma from a +200vdc source. Used in older tube type radios to provide a power source for modern accessories.

## BS-1 33 Position Binary Switch w/Knob

**\$ 17.95**

Rotary switch allows single dial access to all 32 EIA tones, plus an off position if voltage lead is routed through switch. Supplied with knob, nutcover, and stick-on label.

## RB-1 Reverse Burst Sender

**\$ 14.95**

Eliminates the long squelch tail heard with some reed type and other sub-tone decoders. When used in conjunction with decoders that offer squelch tail elimination, the RB-1 will delay the transmitter turn-off time. Size 1.0" x 1.0" x 0.5".

## BXK-1 Box and Switch Kit

**\$ 31.22**

Enclosure kit includes a high impact plastic case (top, bottom, front and back) which measures 5.25" x 3.3" x 1.7", plus mounting hardware, and a 33 position binary switch and knob. Will separately house many of our tone signaling products.

**NEW!**

## RC-1 DTMF Remote Controller

**\$ 49.95**

Allows DTMF telephone access to PE-1000 Paging Encoder. Installs inside PE-1000, making it operate similar to larger and more costly telephone accessible paging terminals. Requires audio input from the phone line.

## DS-1 Five Position DIP Switch

**\$ 2.70**

Finger operable DIP switch allows remote addressing of any of our binary coded programmable products. Popular for use in many amateur handhelds.

## VA-1 Varactor Assembly

**\$ 3.00**

Varactor modulator assembly for adding tone directly to transmitter crystal. For older tube type radios that were not designed to use tone signaling.



# PRICE LIST (Service Station Net)

*In Alphabetical Order*

Name	Description	1-9	10-24	25-49	50-99	100-up
AP-1	Four-tone Repeater Board, GE	\$ 39.95	\$ 37.95	\$ 35.96	\$ 33.96	\$ 31.96
AR-12	12 Position Diode Matrix Board	19.95	18.95	17.96	16.96	15.96
BS-1	33 Position Binary Switch w/Knob	17.95	17.05	16.15	15.26	14.36
BXK-1	Box and Switch Kit	31.22	29.66	28.10	26.54	24.98
DI-16	Data Interrogator for TP-38	249.95	237.45	224.95	212.46	199.96
DS-1	Five Position DIP Switch	2.70	2.56	2.43	2.29	2.16
DTD-1	Single Function DTMF Decoder	59.95	58.45	56.95	53.96	50.96
HHP-1	Handheld Memory Programmer, IC-110	199.95	189.95	179.95	169.96	159.96
HP-1B	Miniature High Pass Filter	9.95	9.45	8.95	8.46	7.96
PE-1000A	Paging Encoder, Motorola/GE Tones	224.95	213.70	202.45	191.21	179.96
PE-1000B,C,D	Paging Encoder, Misc. Formats	249.95	237.45	224.95	212.46	199.96
PE-1000P	Paging Encoder, RPC1 (POCSAG)	324.95	308.70	292.45	276.21	259.96
PE-1000RM-A	Rack Mount Paging Encoder	324.95	308.70	292.45	276.21	259.96
PE-1000RM-B,C,D	Rack Mount Paging Encoder	349.95	332.45	314.95	297.46	279.96
PE-1000RM-P	Rack Mount Paging Encoder, POCSAG	424.95	403.70	382.45	361.21	339.96
PE-2PA,B,C,D,E	Two-tone Sequential Encoder	54.95	53.58	52.20	49.95	46.71
PS-1	Base Power Supply	5.00	4.75	4.50	4.25	4.00
RB-1	Reverse Burst Sender	14.95	14.20	13.46	12.71	11.96
RC-1	DTMF Remote Controller	49.95	47.45	44.95	42.46	39.96
SD-1000A,B,C,D,E	Two-tone Sequential Decoder	59.95	58.45	56.95	53.96	50.96
SS-32PA,B	Miniature Encoder, CTCSS or Burst	28.95	27.50	26.05	24.61	23.16
SS-32SMP	Micro-miniature CTCSS Encoder	27.95	26.55	25.15	23.76	22.36
SS-32SMP-B	Micro-miniature Audible Encoder	32.95	31.30	29.65	28.01	26.36
TE-12PA,B	Twelve Tone Encoder, Enclosed	89.95	85.45	80.96	76.46	71.96
TE-64	Multi-tone Bench Encoder	79.95	75.95	71.96	67.96	63.96
TE-64D	TE-64 with LED Display	129.90	123.40	116.91	110.41	103.92
TE-64D-MOD	LED Modification kit for TE-64	49.95	48.70	47.45	44.95	42.46
TP-DCS	Digital CTCSS Module for TP-38	149.95	142.45	134.95	127.46	119.96
TP-DCS/TOS	Combination Module	199.95	189.95	179.95	169.96	159.96
TP-DTMF	Remote Access Module for TP-38	59.95	56.95	53.95	50.96	47.96
TP-TOS	Tone Switch Module for TP-38	99.95	94.95	89.95	84.96	79.96
TP-38	Shared Repeater Tone Panel	595.00	565.25	535.50	505.75	476.00
TS-32F	Encoder-decoder, Ferritronics	67.90	66.20	64.51	61.11	57.72
TS-32P	Programmable CTCSS Encoder-decoder	57.95	56.50	55.05	52.16	49.26
TS-32R	Encoder-decoder, Regency/Wilson	65.50	63.86	62.23	58.95	55.68
TSU-32P	Encoder-decoder, Universal Plug-on	57.95	56.50	55.05	52.16	49.26
VA-1	Varactor Modulator Assembly	3.00	2.85	2.70	2.55	2.40

Consult with factory for larger quantity pricing.

Full One Year Warranty on all products when returned to the factory for repair.

We are continually updating our product line of direct plug-in tone boards and detailed application notes.

Please contact the factory for the most recent additions to our product line.

